REMARKS/ARGUMENTS

Re: 101 and 112 rejections

Applicants deleted Claims 5 and 11 and therefore these formal rejections are avoided.

Re: 102 rejection

Claims 1-5 and 10-11 are rejected as anticipated by Dubensky, Jr. et al.

Applicants amended Claim 1 to require "An aqueous nanocarbons solution comprising: nanocarbons ---". Thus, the solution of the present invention essentially contains nanocarbons. On the other hand, the solution disclosed in Dubensky, Jr. et al. does not contain any nanocarbons nor are they suggested. This is a case of an accidental overlap which is now avoided. Accordingly, the present invention as now amended is not anticipated or obvious over Dubensky, Jr. et al.

Claims 1-2, 4-7, 10-12 and 14 are anticipated over Bandyopadhyaya et al (with other art cited as evidence). Also Claims 1-2, 5-6, 12 and 14 are rejected as anticipated over Okuzono.

Regarding one of the solubilizing agents for nanocarbons "water-solubilizing agent for nanocarbons having a weight average molecular weight of from 10,000 to 50,000,000", this is now limited to alginates. On the other hand, the solutions of Bandyopadhyaya (containing Gum Arabic) , Nakashima et al, and Okuzono (containing DNA) do not contain a surface active agent capable of forming globular micelles having a diameter from 50 to 2000 nm in the solution nor alginates having a weight average molecular weight of from 10,000 to 50,000,000. Accordingly, the present invention as now claimed is not anticipated over Bandyopadhyaya, Nakashima et al, or Okuzono.

Here, in the Official Action, Applicants are requested to prove that the prior art products do not necessarily or inherently possess the characteristics of the claimed product.

Applicants first note that inherent anticipation requires certainty not just possible or probable inherency.

Furthermore, as is well known, a globular micelle is composed of a plurality of molecules (surface active agent) which have hydrophilic area and hydrophobic area at a separated location in each other. Referring to the attached drawings, as shown in

Fig.1, the hydrophilic area of the molecules is located at the outward position and the hydrophobic area of the molecules is located at the inward position, when the molecules form globular micelles in an aqueous solution. Thus, it is necessary for molecules to have hydrophilic area and hydrophobic area at a separated location in each other so that a globular micelle can be formed from the molecules. From this viewpoint, attached Fig.2 shows the chemical structure of the typical surface active agents (Claim 3) of the present invention, Gum Arabic (Bandyopadhyaya) and DNA (Nakashima, Okuzono). As clear from Fig.2, the surface active agents of the present invention have hydrophilic area and hydrophobic area at a separated location in each other, whereas hydrophilic area and hydrophobic area are not clearly distinguishable in either of Gum Arabic or DNA. Thus, Gum Arabic or DNA, which is not a surface active agent, cannot form a globular micelle as required by the present claims.

Re: 103 rejection

The above art is also cited as rendering the claims obvious. Concerning the incorporation of the anticipation rejection statements into the obviousness rejection, Applicants refer to the

distinctions discussed above.

The heart of the present invention is to use a specific agent for dissolving nanocarbons in water.

The claims are all related by this feature which is embodied in the composition and process claims.

The first feature of the specific agent is a surface active agent capable of forming globular micelles having a diameter from 50 to 2000 nm in the solution. As described in the Specification, the mechanism of dissolving nanocarbons in water according to the present invention is based on the unique idea, which was proposed by the inventor for the first time, that nanocarbons can be solubilized by encapsulating nanocarbons in globular micelles. From this viewpoint, any prior art shown in the Official Action does not disclose nor suggest such idea, and, there is no hint to set the size of globular micelle at the predetermined range (50 to 2000 nm) to encapsulate nanocarbons in globular micelles. Accordingly, the first feature of the present invention is not shown or suggested in the cited prior art, alone or in combination.

The second feature of the specific agent is alginates having

a weight average molecular weight of from 10,000 to 50,000,000. attached Fig.3 shows the chemical structure of alginates (one example). As clear from attached Figs.2 and 3, alginates of the present invention are clearly different from Gum Arabic and DNA of the prior art in chemical structure. In particular, although alginates and Gum Arabic belong to same category (polysaccarides), alginates are mainly consisted of β-D-mannaric acid and α-L-guluronic acid as constituent monosaccharides, whereas Gum Arabic is mainly consisted of arabinose, galactose, rhamnose and glucronic acid as constituent monosaccharides. Attached Fig.4 shows these constituent monosaccharides. As clear from Fig.4, the constituent monosaccharides of alginates for the present invention are greatly different from those of Gum Arabic in chemical structure. In particular, all of the constituent monosaccharides of alignates have a carboxyl group, whereas only 14% of the constituent monosaccharides of Gum Arabic has a carboxyl group. In addition, alginates have a linear block polymer where β-D-mannaric acid and α-L-guluronic acid are bonded via 1 position of β-D-mannaric acid and 4 position of α-L-guluronic acid, whereas Gum Arabic has a complicated chemical structure where many branches

from C-6 of main chain (β1→3 bond of galactose residues) exist. Accordingly, a worker in the art would not have considered at the time of the priority date that, even though it is known that Gum Arabic can be used for solubilizing nanocarbons in water, aliginates also may be used for solubilizing nanocarbons in water, when based on the considerable difference in chemical structure. Accordingly, the second feature of the present invention is not shown or suggested in the art, alone or in combination.

In view of the above, the rejections are avoided. Allowance of the application is therefore respectfully requested.

Respectfully submitted,

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Enc. Petition for Extension of Time (three months)
Form PTO-2038 - $1,110
Form PTO-2038- $844 (additional claims)
Attachment Figs. 1-4